

FILE 'REGISTRY' ENTERED AT 07:33:41 ON 30 DEC 2002
L1 1 S 9026-87-3/RN

FILE 'USPATFULL' ENTERED AT 07:34:23 ON 30 DEC 2002
L2 4 S 9026-87-3/RN

FILE 'AGRICOLA, BIOSIS' ENTERED AT 07:35:42 ON 30 DEC 2002
L3 0 S 9026-87-3/RN
L4 373 S 9026-87-3
L5 186587 S MAIZE OR CORN OR ZEA
L6 11 S L4 AND L5
L7 9 DUP REM L6 (2 DUPLICATES REMOVED)
L8 85 S (GENE OR NUCLEIC OR NUCLEOTIDE) AND L4
L9 2 S L8 AND L5

L7 ANSWER 8 OF 17 BIOSIS COPYRIGHT 2002 BIOLOGICAL ABSTRACTS INC.DUPLICATE
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AB Electrophoretic variation and inheritance of four novel enzyme systems were studied in **maize** (*Zea mays* L.). A minimum of 10 genetic loci collectively encodes isozymes of aconitate hydratase (ACO; EC 4.2.1.3.), adenylate kinase (ADK; EC 2.7.4.3), NADH dehydrogenase (DIA; EC 1.6.99.-), and **shikimate dehydrogenase** (SAD; EC 1.1.1.25). At least four loci are responsible for the genetic control of ACO. Genetic data for two of the encoding loci, Aco1 and Aco4, demonstrated that at least two **maize** ACOs are active as monomers. Analysis of organellar preparations suggests that ACO1 and ACO4 are localized in the cytosolic and mitochondrial subcellular fractions, respectively. **Maize** ADK is encoded by a single nuclear locus, Adk1, governing monomeric enzymes that are located in the chloroplasts. Two cytosolic and two mitochondrial forms of DIA were electrophoretically resolved. Segregation analyses demonstrated that the two cytosolic isozymes are controlled by separate loci, Dia1 and Dia2, coding for products that are functional as monomers (DIA1) and dimers (DIA2). The major isozyme of SAD is apparently cytosolic, although an additional faintly staining plastid form may be present. Alleles at Sad1 are each associated with two bands that cosegregate in controlled crosses. Linkage analyses and crosses with B-A translocation stocks were effective in determining the map locations of six loci, including the previously described but unmapped locus Acp4. Several of these loci were localized to sparsely mapped regions of the genome. Dia2 and Acp4 were placed on the distal portion of the long arm of chromosome 1, 12.6 map units apart. Dia1 was localized to chromosome 2, 22.2 centimorgans (cM) from B1. Aco1 was mapped to chromosome 4, 6.2 cM from su1. Adk1 was placed on the poorly marked short arm of chromosome 6, 8.1 map units from rdg1. Less than 1% recombination was observed between Glu1 (on chromosome 10) and Sad1. In contrast to many other **maize** isozyme systems, there was little evidence of gene duplication or of parallel linkage relationships for these allozyme loci.

AN 1988:482422 BIOSIS

DN BA86:113732

TI NEW ISOZYME SYSTEMS FOR **MAIZE ZEA-MAYS** L. ACONITATE
HYDRATASE ADENYLATE KINASE NADH **DEHYDROGENASE** AND
SHIKIMATE DEHYDROGENASE.

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